

The recent appearance of this disease in Malaya should not be viewed with alarm, as in all probability it has been prevalent for some time, but until now has not been identified as *Poria hypobrunnea*.

It would appear that the symptoms are caused by even more than the two fungi mentioned,* *Poria hypobrunnea* and *Fomes pseudoferreus*, although the present record is not from a Para rubber tree, but from another tree, exotic in Malaya, but not a native of the continent which has furnished the Para rubber tree to Malaya.

T. F. CHIPP.

THE MELON FLY, *BACTROCERA CUCURBITAE*.

The melon fly, *Bactrocera cucurbitae*, found its way into the Hawaiian islands in 1895 and there did such serious damage, that Melon growing became impossible. To combat it, the Board of Agriculture and Forestry for Hawaii, sent their Entomologist Mr. David T. Fullaway, to the East in 1917 to seek for insects that prey upon the fly. In the course of his tour he visited Singapore, and soon located *Bactrocera* near the town in a Chinese vegetable garden; and by breeding out the insects he obtained three individuals of a parasite of the genus *Opius*. This was a first step on the road: but he got no more though he reared in captivity 6000 of the flies. Proceeding to Java he found the same *Opius* on the melon fly, and in slightly larger numbers: later on reaching India he got it again about Bangalore. This parasite, *Opius fletcheri*, he conveyed to the Hawaiian islands and turned loose in the neighbourhood of Honolulu. It has done its work to such an extent that in the "Hawaiian Forester and Agriculturist" for April 1920, Mr. Fullaway reports it to destroy 50% of the melon flies, and that "it is again possible to grow melons successfully."

It is very probable that the melon fly is the limiting factor to Melon cultivation in the Straits Settlements: and the occasional successes with melons that reward enterprising people are in that case chiefly due to the Melons being grown out of reach of the fly. Its connection with wild gourds has not been studied.

I. H. BURKILL.

THE COHUNE NUT.

The recent fruiting of the Cohune palm, believed to be its first in the Malay Peninsula, calls for more than a bald record.

With this object in view the following notes have been prepared and give (1) a short description of the plant, (2) its native habitat (3) its uses, so far known, (4) the results of analysis of the

* Cf. Belgrave, A wet of rot Para Rubber Roots, in Department of Agriculture, F. M. S., Bulletin No. 28.

Nut and difficulties in oil extraction, (5) its possibilities. The plants mentioned above, as having fruited, are situated for the most part in the Botanic Gardens, Singapore; but two of a row of four plants in front of the Raffles Museum, Singapore, have also fruited. These plants are all about the same height and were probably raised from one particular batch of seeds, several consignments of which have been received and successfully raised at the Botanic Gardens, at various times. In view of this it can be safely assumed that all the plants now fruiting are of the same age. No record has been found to indicate the exact age of the trees, but as a result of careful enquiries it has been established beyond doubt, that they are from 25 to 30 years old. Care has been taken to avoid understating the age, in order that experiments from a commercial point of view, should not be attempted under a misapprehension as to the length of time which must elapse between the time of sowing the seed and the fruiting period.

Up to the latter of part of 1918, the plants of *Attalea Cohune* in the Botanic Gardens, Peradeniya, Ceylon had not produced fruits.

GENERAL DESCRIPTION OF THE PALM.

Attalea Cohune, Mart.—the Cohune Nut Palm. A magnificent feather-leaved palm which attains a height of about 40 feet. In the ordinary way the old leaves are cut off and the leaf bases remain on the stem giving it a very rugged appearance. These leaf bases afford a firm footing for ferns, etc., which when established are very ornamental and in the Botanic Garden the palms are so kept. When the leaf bases are thus allowed to remain the stem takes on quite a distinctive shape. At the base it is from 1-2 feet through and gradually thickens upward until at the crown it becomes fully 4-6 feet through. The effect thus produced is certainly striking as the stem is three times thicker at the top than at the bottom. In a specimen from which the leaf bases have been removed the trunk is smooth and cylindrical, there being little difference in size the whole way up. The leaves are produced abundantly at the top of the trunk, are fully 20 feet in length and form a magnificent crown. The pinnae are placed close together on the rhachis and are held more or less rigidly at right angles to it, thus giving a flat surface to the leaf. The leaf becomes twisted at a short distance from the base with the result that the pinnae of the upper three quarters of it have their edges towards the light instead of their faces, as in the older leaves of the majority of the palms. Also, about two thirds of the way up, the rhachis makes another bend, producing a very gracefully curved upper part to the leaf. The inflorescences are produced in the axils of the leaves in fair quantity and are at first enclosed in large tough fibrous spathes from 5 to 6 feet long and $\frac{1}{4}$ inch in thickness. These latter are more or less boat shaped and extend at the apices into horn like structures about two inches in length. They soon split longitudinally on the upper surface and remain during the flowering and part of the fruiting period. Apparently they play

a dual role, at first that of enclosing the tender spadices and later when open protecting them from rain. The spadix is almost the same length as the spathe and bears numerous simple branches, arranged more or less spirally, the longest of which does not exceed 1 foot. The peduncle is about 2 inches thick, is somewhat flattened and the upper half only bears the flowering branches. The latter are more or less uniform in length and are quite thin. Flowers are produced in large quantities on the spadix and are yellowish in colour. Sometimes a spadix bears either all male or else all female flowers, in which case the spadix is dioecious: and sometimes a spadix produces separately both male and female flowers, in which case it is monoecious. Occasionally a few hermaphrodite flowers make their appearance. The male flowers are considerably smaller than the females and in monoecious spathes are borne on the upper parts of the spadix-branches while the female flowers are borne on the lower parts. The fruit is ovoid and large being about $2\frac{1}{2}$ inches long and proportionately broad. A small projection occurs at the apex which originally bore the stigmas of the female flowers: the outer skin or pericarp is fibrous and woody, while the inner skin or endocarp is very hard and bony. These enclose the seed or nut which contains an oil of considerable value.

Habitat. The native habitat of this palm is in tropical America: in British Honduras, it covers huge areas in the form of a natural stand. It is found in low lying parts and produces enormous quantities of fruits.

Uses. So far the palm has not been put to any extensive use. Beyond its local uses it does not yet rank in importance with its relatives the Coconut and Oil Palm. A note in the Annals of Botany XII p. 165, mentions the use of the Cohune Nut in the coagulation of rubber. By exposing a thin layer of Para or Ceara latex to the action of the smoke from the burning shells coagulation is immediately brought about. In this case the species mentioned is *Attalea excelsa*: but doubtless *Attalea Cohune* can serve the same purpose.

The following is an extract from the Gardeners' Chronicle (LXVIII, 1920, p. 211) and seems worthy of repetition for the peep behind the scenes and because it emphasises the important part which science played in the Great War.

"*Attalea Cohune*—the hard shell of the Cohune Nut of Honduras, the fruit of the Manaca Palm, was found when carbonised to give protection against poison gases in the war."

RESULTS OF AN ANALYSIS OF THE NUT AND THE DIFFICULTIES IN OIL EXTRACTION.

A careful analysis of the seeds has been made at the Imperial Institute and the results are recorded in the Bulletin of the Imperial Institute (1913). The conclusion arrived at is that as an oil palm *Attalea Cohune* is a very valuable plant. The analysis showed that "Cohune kernels" yield about the same per-

centage of fat as copra and rather more than palm kernels and it is considered that in the market, the oil should fetch about the same price as coconut oil and palm oil.

There are certain difficulties in dealing successfully with it, the chief of which are (1) the exceptionally hard nut which necessitates special crushing apparatus and (2) that experiments with mechanical crushing show that the kernels bruise very easily and during transit to any distance the oil in them becomes rancid. The latter is under further investigation and it is probable that the difficulties will be overcome successfully in the near future.

Possibilities. The possibility of the palm ever being of any economic value in this country seems improbable, owing to the length of time needed before the plant becomes sufficiently mature to produce fruits. When once this stage has been reached the yield seems fairly regular and no doubt on a large area sufficient fruits could be obtained to make it a paying concern. Until it can be made to produce fruits at an earlier age it is of no value in Malaya. It seems to be a subject for further investigation and if data could be obtained from British Honduras dealing with yield and age, the question could quickly be settled as to whether it would be worth while experimenting with a view to shortening the period needed for fructification or not worth while.

The note dealing with the use of *Attalea* nuts in the coagulation of rubber, points to two possibilities:—(1) the extraction of oil from the kernels and (2) the use of the hard shell for coagulating rubber, provided *Attalea Cohune* and *Hevea brasiliensis* could profitably be grown in close proximity. The latter point is open to criticism in that a certain amount of oil of an inferior quality can be extracted from the shells and with the mechanical problems solved no doubt this would be extracted and placed on the market. Which of these two procedures would be most profitable it is not possible to state and can only be determined by actual experiment. It may be mentioned in passing that as *Attalea Cohune* grows in low lying land, there would appear to be a use for the low-lying swampy portions of land often found on estates and which are put to no practical use. This however, all depends upon the question of shortening the period between the sowing of the seed and the fruiting stage, so far as Malaya is concerned.

F. FLIPPANCE.

THE BRAZIL-NUT TREE IN SINGAPORE.

In 1911 Mr. W. J. Young, discussed the Brazil nut in the Pomona College Journal of Economic Botany, 1, pp. 122-134, and came to conclusions which are questionable. It is convenient to introduce the subject in his own opening sentences. "The genus, *Bertholletia*, to which is assigned the Brazil-nut of commerce, was